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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them	)	
	)	PR Docket No. 92-235
and	)	
	)	
Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Radio Services	)	

COMMENTS OF THE BOEING COMPANY

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TABLE OF CONTENTS

SUMMARY OF POSITION

Boeing commends the Commission for initiating this proceeding to promote the efficient use of spectrum and the deployment of spectrally efficient technologies in the PLMR bands. Boeing, however, is concerned that the market-based mechanisms proposed by the *Notice* will not achieve their intended result and, instead, will harm users of private radio spectrum.

Boeing does not dispute the appropriateness of using auctions to allocate spectrum that will be used to provide spectrum-based services to third parties for profit. The allocation of private radio spectrum, however, raises very different considerations. Many licensees rely on private radio to satisfy specialized, yet critical, communications needs for which wireline and CMRS are either unsuitable, economically impractical, or simply not available. PLMR licensees therefore require private radio spectrum to conduct their day-to-day business operations.

Competitive bidding would be a particularly inappropriate way of allocating private radio spectrum. If open to all comers, auctions would pit licensees that need spectrum for their own internal purposes against resellers that plan to use the spectrum to provide services to third parties for profit. Because resellers would expect to recoup the cost of the spectrum auctioned, they would almost always be willing to pay more than traditional PLMR licensees. Industrial users like Boeing, which have an absolute need for private radio spectrum, would have no choice but to try to outbid resellers for spectrum. If successful, the added expense created by auctions would only reduce their ability to compete in today's global economy. If unsuccessful, these users would be forced to make fundamental changes in the way in which they do business to accommodate their loss of private radio spectrum.

The Commission should also not adopt the system of user fees proposed by the *Notice*. These fees would not promote spectral efficiency because they are predicated on demographic and other market factors that are totally unrelated to the efficiency with which spectrum is used. Allowing the resale of PLMR spectrum also would be inappropriate. It would blur the distinction between private and commercial radio services by transforming today's PLMR bands into CMRS spectrum. This, in turn, would constrict, rather than expand, the amount of spectrum available to private radio users.

Rather than pursuing the foregoing market-based alternatives, Boeing urges the Commission to consider another approach. More specifically, the Commission should adopt an efficiency-based system of license fees. Such a system should entail a graduated fee structure based on objectively verifiable efficiency-related factors, including the bandwidth required by the licensee's equipment, the licensee's use of spectrally efficient technology, the number of units assigned to each channel, and the duty cycle of the spectrum.

An efficiency-based system of license fees would reward efficient spectrum users with lower fees and discourage inefficient spectrum use through higher fees. Such a system also would encourage the deployment of spectrally efficient technologies, while at the same time recovering for the public an appropriate portion of the value of the spectrum being licensed. Moreover, it would do so without any of the negative consequences of the market-based alternatives set forth in the *Notice*.

Finally, the Commission should proceed with the consolidation of existing PLMR user groups and establish a central oversight body to ensure that spectrum is used efficiently within, and equitably allocated among, the various user groups.

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COMMENTS OF THE BOEING COMPANY

The Boeing Company, by its attorneys, hereby submits the following comments in response to the Further Notice of Proposed Rule Making ("*Notice*") which the Commission issued in the above-captioned proceeding on June 23, 1995.[1] In the *Notice*, the Commission has requested comments on its proposal to introduce market-based mechanisms, such as competitive bidding, user fees, resale, and exclusivity, to promote the more efficient use of spectrum in the private land mobile radio ("PLMR") bands.[2]

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[1] *See Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Services,* Report and Order and Further Notice of Proposed Rule Making, PR Docket No. 92-235, FCC 95-255 (rel. Jun. 23, 1995) [hereinafter "*Notice*"].

[2] *See id.* at ¶ 112.

I. INTRODUCTION

The Boeing Company is the world's largest manufacturer of commercial aircraft and a leading defense contractor. It is also a major user of private radio spectrum. Like other industrial PLMR licensees, Boeing uses private radio spectrum for a wide variety of specialized, yet critical, communications needs that cannot be satisfied by wireline or commercial mobile radio services ("CMRS"). In particular, Boeing employs private radio to provide safety and emergency services and to enhance the productivity of its manufacturing operations.[3] Boeing also uses radio spectrum in other highly specialized ways, such as satellite and microwave communications, flight test telemetry, and other aviation-related applications.

Although Boeing is already a major user of private radio spectrum, the company anticipates that its need for spectrum will continue to grow. Boeing therefore wishes to commend the Commission for initiating this proceeding and considering ways to ensure that adequate spectrum is available to satisfy future PLMR demand. Boeing, however, urges the Commission to consider an alternative to the market-based mechanisms proposed by the *Notice* to achieve this goal.

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[3] More specifically, Boeing uses private radio for: health and safety purposes, such as regulatory compliance, communication with personnel in confined and hard-to-reach areas, and fire, security and emergency services; research and development; robotics; the control and monitoring of production; material handling; machine programming; inventory management and control; transportation; and internal communications services.

II. THE COMMISSION SHOULD USE EFFICIENCY-BASED LICENSE FEES, RATHER THAN COMPETITIVE BIDDING OR OTHER MARKET-BASED ALTERNATIVES, TO PROMOTE THE EFFICIENT USE OF PRIVATE RADIO SPECTRUM

A. The Commission Should Not Adopt the Market-Based Mechanisms Proposed by the *Notice*.

In the *Notice*, the Commission has explained that the primary goal of this proceeding is to create a regulatory environment that will promote the efficient use of existing spectrum allocations and encourage the deployment of new and innovative spectrally efficient technologies.[4] The Commission also has suggested that the framework adopted in this proceeding should compensate the public for the use of valuable spectrum resources.[5] Although Boeing supports these goals, it is concerned that the mechanisms proposed by the *Notice* do not "address the diverse communications requirements of the wide array of large and small private wireless users . . . ."[6] More specifically, Boeing is concerned that the Commission's proposals do not take into account the fundamental differences between private land mobile and commercial mobile radio services.

Competitive Bidding. When Congress granted the Commission authority to use competitive bidding to allocate radio spectrum in 1993, it concluded that the public should be compensated by licensees for spectrum used to provide spectrum-based services to third parties. In effect, Congress decided to allow the Commission to sell spectrum that is ultimately resold for profit by the licensee. Boeing does not dispute the appropriateness of using competitive

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[4] *See Notice* at ¶ 110.

[5] *See id.* at ¶ 141.

[6] *Id.* at ¶ 3.

bidding to allocate spectrum in such situations. There are sound public policy reasons why the public ought to share in the economic value of services which, but for the spectrum being licensed, would not exist. In such instances, auctions provide a good measure of the value of the business which the spectrum makes possible, albeit not the value of the spectrum itself. The Commission is to be commended for securing this value for the public through its enormously successful auctions.

The allocation of private radio spectrum raises very different considerations. As the Commission has recognized, businesses often have "special communications needs."[7] Some of these needs can be satisfied by wireline carriers and CMRS providers. There are other requirements, however, for which wireline and CMRS solutions are either unsuitable, economically impractical, or simply not available. Factory floor operations, for example, which require constant communication with employees in overhead cranes and hard-to-reach places such as tunnels (or, in Boeing's case, aircraft fuel tanks) cannot be supported by these services. Nor can Boeing's specialized, yet critical, need for emergency and safety services be satisfied by third-party vendors. Although there exist other needs which are capable of being met by commercial services, there are no third-party providers of these services. Industrial users such as Boeing therefore require private radio spectrum to conduct their day-to-day operations.[8]

Competitive bidding is a totally inappropriate way in which to allocate spectrum to licensees that use private radio to satisfy their own critical communications needs. As the

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[7] *Id.* at ¶ 2.

[8] Private radio can be, and is often, used in concert with commercial mobile radio services to provide integrated solutions to the complex communications needs of industrial licensees.

Commission has correctly recognized, auctions place "licenses in the hands of those who value the licenses most highly . . . ."[9] Auctions, however, do not necessarily award licenses to those who need them most. If open to all comers, auctions for private radio spectrum could involve both resellers that plan to use the spectrum to provide services to third parties for profit and PLMR eligibles that have a legitimate need for spectrum for their own internal purposes.

The bids submitted by resellers and private radio licensees would reflect the different purposes for which the spectrum would be used. The bids of resellers would reflect the expected profit to be derived from providing CMRS to third parties. The bids of private radio licensees, by contrast, would reflect the value they derive from use of the spectrum. As a consequence, resellers (or PLMR licensees that see auctions as an opportunity to enter a new line of business or create new revenue streams) would almost always be willing to pay more for a license than a traditional private radio licensee.[10]

Because there are no substitutes for most private radio applications, industrial users like Boeing would have no choice but to try to outbid resellers for spectrum. If successful, they would be required to absorb the costs of these auctions or pass them on to their customers in the form of higher priced goods and services. For companies like Boeing, which compete in price-sensitive markets against foreign suppliers, the added expense of auctions would only

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[9] *See "FCC in Midst of Vigorous Effort to Reinvent Itself in Cooperation With the President's Regulatory Reinvention Initiative,"* FCC News Report, Mimeo No. 55841, at 1 (Sep. 18, 1995).

[10] Thus, even if limited to PLMR licensees, auctions would be a source of harm to industrial licensees like Boeing. Moreover, auctions could be used for anticompetitive ends. For example, rivals could use auctions to drive up their competitors' costs. Alternatively, rivals could seek to become the bottleneck supplier of, and thus be in a position to manipulate, a resource needed by their competitors.

serve to reduce their margins and weaken their ability to compete in today's global economy. If unsuccessful, these users would be required to make fundamental changes in the way in which they do business to accommodate their loss of private radio spectrum. This, in turn, would cause a decline in the productivity of these users. Plainly, the public interest would not be served by either result.

Exclusivity and Resale. In addition to auctions, the Commission has proposed to offer private radio licensees that convert to narrowband technologies the option of obtaining exclusive channel assignments in the PLMR bands.[11] Part and parcel of this exclusivity would be the licensee's right to resell its spectrum.[12] As the *Notice* correctly observes, offering private radio licensees exclusivity would in fact promote the more efficient use of spectrum; it would do so by enabling "users to introduce more spectrally efficient technologies, such as trunking, without the fear that other users will . . . interfere with their trunked equipment."[13] As a user of an extensive trunked radio system, Boeing is well aware of the interference caused by conventional technologies operating on the same channel as trunked technologies. The Commission is therefore to be commended for recognizing the value to users of protected service areas.

Boeing, however, is strongly opposed to the Commission's proposal to allow PLMR users to resell their spectrum, a proposal which the Commission considers to be an

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[11] *See id.* at ¶ 118.

[12] *See id.* at ¶ 120.

[13] *Id.* at ¶ 118.

"essential element" of exclusivity.[14] Allowing PLMR licensees to resell private radio spectrum would ultimately blur the distinction between private and commercial radio services. In doing so, it would defeat one of the principal purposes of this proceeding, *i.e.*, to promote the efficient use of spectrum so as to ensure that the present and future needs of PLMR licensees can be met. Allowing resale would transform today's PLMR bands into CMRS spectrum and constrict, rather than expand, the amount of spectrum available for private radio users. In this regard, there is no reason to believe that a PLMR licensee that chooses to resell its spectrum would have any more interest than existing CMRS providers in meeting the special needs of industrial users of private radio spectrum.

The right to resell capacity will also inevitably lead to spectrum auctions. As noted above, such auctions would needlessly increase the cost of private radio spectrum. This, in turn, would jeopardize the ability of licensees to meet their internal communications needs or to remain competitive in today's global economy. It could also needlessly inflate the price of goods and services produced by PLMR licensees.

Resale is not likely to provide users with a strong incentive to use spectrum efficiently for another reason. It is predicated on the incorrect assumption that private radio users have an interest in -- and, more important, the ability to -- resell their capacity to third parties. As noted above, most users of PLMR spectrum have become Commission licensees because they know of no other means of satisfying their unique communications needs. Very few of these users are involved in communications-related businesses. There is thus no reason

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[14] *See id.* at ¶ 119.

to assume that they have an interest in using their spectrum to provide service to third parties and thereby become subject to regulation as CMRS providers.[15]

Even if the Commission could properly assume the existence of such an interest, there is no evidence that a viable market would exist for this resold capacity. In many parts of the country, there would simply be inadequate demand. Even if such demand were to exist, private radio users might be reluctant to rely on a competitor engaged in the same line of business for the radio services which they need to remain competitive. Perhaps most important, few private radio licensees possess the requisite technical and marketing resources to engage in an endeavor that is unrelated to, and has no synergies with, the licensee's principal line of business. In today's increasingly competitive economy, few PLMR licensees could justify such a diversion of their personnel and resources.

Instead of offering private radio users exclusivity and a right of resale,[16] the Commission should offer PLMR licensees (especially those that employ spectrally efficient technologies) protected service areas. Coupled with a system of efficiency-based license fees discussed below,[17] protected service areas would encourage users to convert from inefficient conventional technologies to spectrum-efficient technologies, such as trunking, without the risk

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[15] Boeing notes that the Commission has tentatively concluded that licensees that resell spectrum will be regulated as CMRS providers. *See id.* at ¶ 135.

[16] *See infra* pp. 11-13.

[17] If, however, the Commission does adopt a system of exclusivity with a right of resale, the Commission should only allow private radio licensees to purchase the resold spectrum. This will help limit the adverse economic consequences of allowing PLMR licensees to transform themselves into CMRS providers.

of interference. Such protected service areas would also facilitate the sharing and cooperative use of spectrum by PLMR licensees, without any of the negative effects of resale.

User Fees. In the *Notice*, the Commission also has proposed a system of user fees that would be implemented as an alternative to, or in conjunction with, the other market-based alternatives that it has identified.[18] Although Boeing agrees with the Commission that a fee-based system would be an appropriate mechanism to promote efficient spectrum use, the user fees proposed by the *Notice* are improperly focused and are therefore unlikely to accomplish that goal.

The principal shortcoming of the user fees contemplated by the *Notice* is that they are designed, by the Commission's own admission, to "reflect the market value of the spectrum."[19] In other words, the proposed fee structure is totally unrelated to the efficiency with which spectrum is used by licensees. The *Notice*, for example, alternatively suggests that user fees should vary according to such factors as the licensee's "area of operation,"[20] the licensee's "opportunity cost,"[21] and the "population coverage and population density" of the area being served.[22] None of these factors is even remotely related to the efficiency with which a licensee uses its spectrum. Thus, under the Commission's proposal, an efficient licensee could well pay more in user fees than an inefficient licensee, depending on where the user is

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[18] *See Notice* at ¶ 136.

[19] *Id.* at ¶ 138.

[20] *Id.* at ¶ 137.

[21] *Id.*

[22] *Id.*

geographically located.[23] In short, the user fees contemplated by the *Notice* would not provide licensees with any direct incentive to use spectrum efficiently.

There are also other reasons why the user fees proposed by the *Notice* are not appropriate for private radio licensees. Although factors such as "area of operation, population coverage and population density" are important to the operation of commercial radio systems,[24] they are of little relevance to PLMR licensees. Unlike CMRS providers, PLMR licensees do not provide service to the entire community within their service area. Rather, they use spectrum to provide service only to the receivers on the licensee's private system. As a consequence, the "demographics of the licensed area" are not relevant to the operations of PLMR licensees.

B. The Commission Should Adopt a System of Efficiency-Based License Fees.

Rather than pursuing the market-based alternatives set forth in *Notice*, Boeing urges the Commission to consider another approach. More specifically, the Commission should adopt an efficiency-based system of license fees that provides users with a direct financial incentive to design and operate their systems in a spectrally efficient manner.[25] Such an approach should entail a graduated fee structure that rewards private radio licensees that design their systems to use spectrum efficiently and discourages inefficient spectrum use through higher license fees.

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[23] In the Commission's view, "user fees should also reflect the demographics of the licensed area so that a licensee in a small rural area does not pay the same user fee as a licensee in a major urban center . . . ." *Id.* at ¶ 138.

[24] *Id.* at ¶ 137.

[25] Like the Commission, Boeing believes that it is timely to consider such a system. *See id.* at ¶¶ 6, 136.

To ensure that license fees achieve their intended result -- *i.e.*, that they promote efficiency -- they should be based on a matrix of objectively verifiable spectrum-related factors. These factors could include the bandwidth required by the licensee's equipment, the licensee's use of spectrally-efficient technology, the number of units assigned to each channel, and the duty cycle (*i.e.*, the daily amount of use) of the requested spectrum. Based on these and perhaps other efficiency-related factors,[26] the Commission should assess users a one-time fee at the time it issues a license. The ease of administrating such a system compares favorably to the market-based approaches outlined by the *Notice*.

An efficiency-based licensing system would plainly serve the goals identified by the *Notice*. Such a system would encourage efficient, state-of-the-art system design at the time an applicant seeks or renews a license by rewarding efficient spectrum use with lower license fees.[27] Moreover, it would do so without any of the negative consequences of the market-based alternatives set forth in the *Notice*. By providing all users with a simple and direct incentive to use spectrum efficiently, such a system would encourage the deployment of spectrally efficient equipment and technologies. An efficiency-based licensing system would also have the added

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[26] The Commission should not use market-based factors, such as the "population served" or other criteria proposed by the *Notice*, to structure user fees. *See id.* at ¶ 137; *supra* pp. 10-11.

[27] It would also encourage licensees to depreciate their systems over the life of their license and to redesign and reequip their systems each time their license is renewed. Annual user fees might create an incentive among PLMR licensees to defer efficiency-enhancing measures since these fees would presumably be subject to annual adjustment.

virtue of recovering for the public an appropriate portion of the value of the spectrum resource being licensed.[28]

III. ANY CONSOLIDATION PLAN ADOPTED BY THE COMMISSION SHOULD FOCUS ON THE EFFICIENT ALLOCATION OF SPECTRUM

In the *Notice*, the Commission has proposed to consolidate the twenty existing PLMR radio services into two to four user groups.[29] Boeing concurs in the Commission's assessment that such consolidation is necessary to distribute assignments between low-use and high-use groups more evenly, simplify inter-service sharing procedures, organize channel allocations so as to enable licensees to use advanced technologies more easily, and organize the PLMR services in such a manner as to achieve more efficient and flexible spectrum use.[30]

Under the plan proposed by the *Notice*, however, there is no mechanism for ensuring that spectrum will be used with equal efficiency by all user groups. Boeing therefore recommends that the Commission establish a central oversight body, comprised of each of the user groups, that is responsible for ensuring that spectrum is used efficiently within, and equitably allocated among, the various services. Unlike individual frequency coordinators, such an oversight body would be in a position to ensure that the various user groups achieve equal efficiency.

Boeing is also concerned that the consolidation of radio services could result in economic inefficiencies and harmful interference if traditional private radio licensees are

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[28] The fees imposed on licensees that make efficient use of private radio spectrum should not be so high as to offset the value of the spectrum being used.

[29] *See id.* at ¶ 52.

[30] See *id.* at ¶ 51.

consolidated with third-party resellers. The Commission should therefore not consolidate licensees that resell their capacity to third parties with private radio users. The interests and needs of such resellers are not necessarily consonant, and are likely to be inconsistent, with the deployment of spectrally efficient technologies by traditional PLMR licensees.

Any consolidation plan adopted by the Commission should also take advantage of the cooperative relationships developed by frequency coordinators. Private radio coordinators know their constituents and how they use spectrum. They are thus in a position to recommend how best to consolidate existing PLMR licensees. For this reason, Boeing recommends that the Commission consider the views of the PLMR community as set forth in the response to the Commission's request that they "negotiate and submit a comprehensive consensus plan for consolidation."[31]

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[31] *Id.* at ¶ 52.

IV. CONCLUSION

For all of the reasons set forth above, Boeing urges the Commission to reject the market-based alternatives proposed by the *Notice*, because they are unlikely to achieve the Commission's stated goal of promoting spectral efficiency. Instead, the Commission should adopt an efficiency-based system of license fees designed to promote the efficient use of private radio spectrum. Finally, the Commission should proceed with the consolidation of existing PLMR user groups and establish a central oversight body to ensure that spectrum is fairly allocated and efficiently used.

Respectfully submitted,

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